

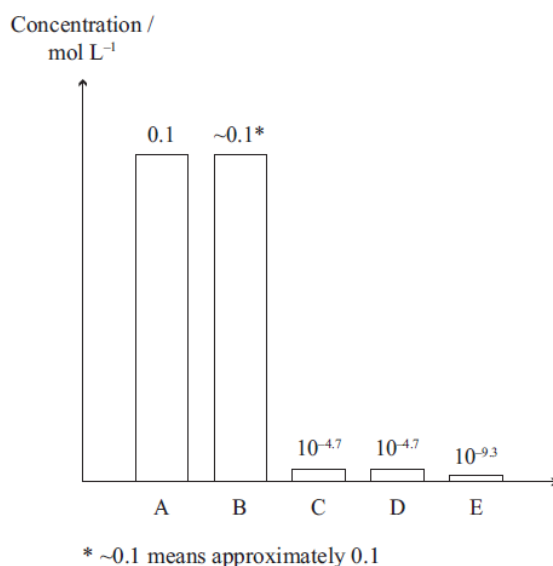
## Concentrations of species in solution

1) List all the species in the aqueous solution of methanoic acid in order of decreasing concentration. Give reasons for your answer.

2) Classify the following  $0.100 \text{ mol L}^{-1}$  solutions by writing the correct description from the terms below.

*strong acid   weak acid   neutral   weak base   strong base*  
 *$\text{NH}_3$     $\text{NaCl}$     $\text{NH}_4\text{Cl}$     $\text{HF}$*

3) The bar chart below shows the relative concentrations of the species (excluding water) in a solution of  $0.1 \text{ mol L}^{-1} \text{NH}_4\text{Cl}$ . (The bar chart is not drawn to scale.) Identify the species A to E. Justify your answer.

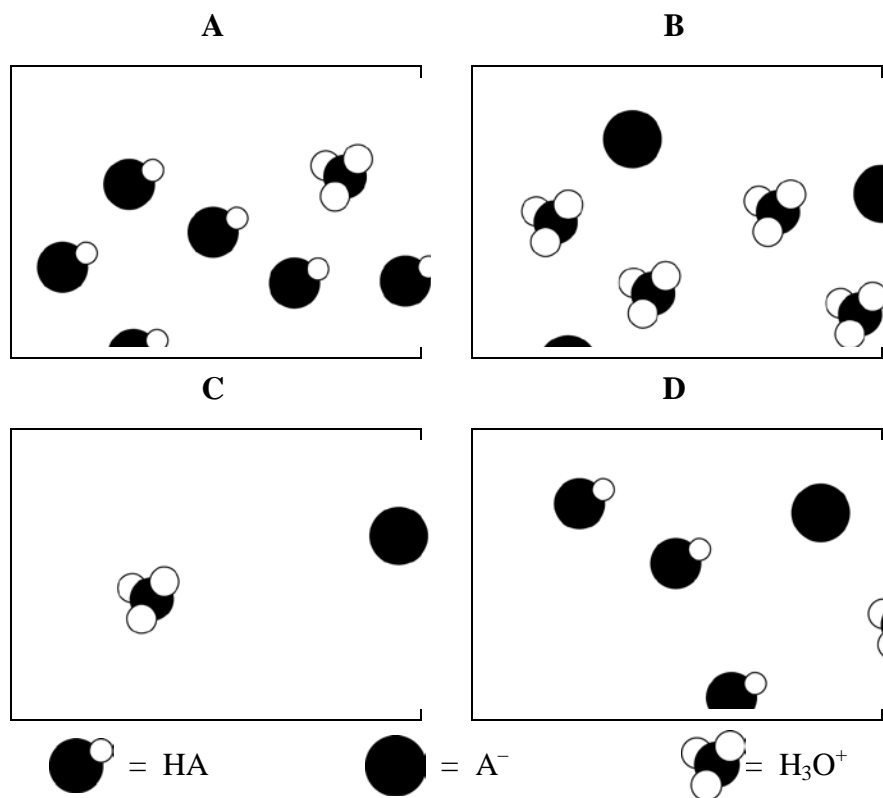


4) List all the species in each of the following  $0.1 \text{ mol L}^{-1}$  aqueous solutions in order of **decreasing** concentration. Do not include  $\text{H}_2\text{O}$ .

i)  $\text{CH}_3\text{NH}_2$

ii)  $\text{NH}_4\text{Cl}$

5) The boxes below show particle representations of the species (excluding water) in four aqueous solutions.



Choose the box that **best** illustrates each of the solutions (i)–(iii) below. In each case, give a reason for your answer.

i) A dilute solution of a strong acid

ii) A concentrated solution of a weak acid

iii) A buffer solution